(Adapted) Final Exam Review

Unit 1: Essential Skills with Numbers

Name: Key

Fill in the place value for each digit.

ten thousands	thousands	hundreds	tens	ones	tenths	hundredths	thou sandths	ten thou sandths
7	8	4	0	1	8	3	4	5

1. Round.
   (a) 223 to the nearest ten 220
   (b) 4851 to the nearest hundred 4900
   (c) 102 480 to the nearest thousand 102 000
   (d) 12.351 to the nearest hundredth 12.35
   (e) 0.00186 to the nearest ten thousandth 0.0019

2. Write the number for:
   a) six million, twenty thousand, seven hundred nine and two hundred three hundred thousandths. 6,020,709.00203
   b) seventy five hundredths 0.75
   c) two hundred three and three hundred fifty two ten thousandths 203.0352

3. Write the number in words:
   a) 2401 two thousand four hundred and one
   b) 52.004 fifty-two and four thousandths
   c) 30700.00428 thirty thousand seven hundred and four hundred twenty-eight hundred thousandths

4. Evaluate

$12 \div 2 + 1 \times 5$
$= 6 + 5$
$= 11$

$24 \div 2 - 3(2 + 1)$
$= 6 - 3(3)$
$= 6 - 9$
$= -3$

5. Arrange the numbers from least to greatest:

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~~22.025~~ ~~2.052~~ ~~2.2025~~ ~~220.25~~ ~~2.5022~~

2.052, 2.2025, 2.5022, 22.025, 220.25

least greatest

6. The total cost for groceries at a supermarket for 3 different families are listed.

$62.31 $65.52 $58.02

a) Which family spent the most?

$65.52

b) How much did they spend all together?

62.31 + 65.52 + 58.02

= $185.85

c) The family that had the largest bill spent how much more than the family with the smallest bill?

65.52
- 58.02
$7.50

d) If the family that spent the least, spent the same amount every week, how much would they spend in a month?

58.02
× 4
232.08

7. Calculate.

(a) 7.3 + 0.12 + 9

= 16.42

(b) 12.6 - 8.9

= 3.7

(c) 118.72 - 43.15 + 29.7

= 105.27

(d) 826.8 + 39.79 - 11.46

= 855.13

8. Mandy goes to watch a hockey game knowing that transportation will be $3.75, admission will be $25.75, and a program will be $5.00. If she takes $45 with her, how much will she have left to spend on snacks?

$\$45 - (3.75 + 25.75 + 5)$

$= 45 - 34.5$

$= \$10.50$

9. Calculate (using the short cuts for working with powers of 10)

(a) 23.151 X 100 = 2315.1

(b) 8.7 x 1000 = 8700

(c) 116.3 ÷ 10 = 11.63

(d) 8950.45 ÷ 1000 = 8.95045

(e) 21.07 x 100 = 2107

(f) 248 ÷ 10 = 24.8

(g) 1.728 x 1000 = 1728

8950.45 ÷ 1000000006 ÷ 100

0.006 ÷ 100 = 0.00006

10. Circle the correct answer for each question.

a) 24.2 x 0.7 — 1694 — 169.4 — (16.94) — 1.694

b) 0.13 x 4.02 — 5226 — 5.226 — 52.26 — 5.226 — (0.5226)

11. Calculate

	Easier question	answer
2.3 X 1.5	2 x 2 = 4	3.45
1.6 x 0.02		0.032
27.8 ÷ 0.04		695
50.43 ÷ 4.1	50 ÷ 4 = 12.	12.3

FRACTIONS

1. Write the factors of 36. *(which numbers skip count to 36)*

   1, 2, 3, 4, 6, 9, 12, 18, 36

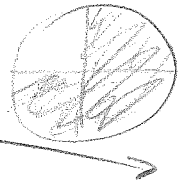
2. Write the multiples of each of the following:

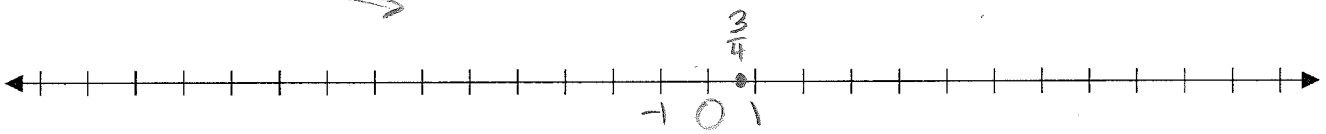
   (a) 3 6, 9, 12, 15, ...

   (b) 5 10, 15, 20, 25, ...

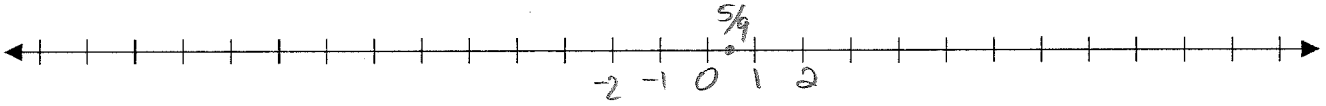
3. Draw a model for each fraction **and** identify where it is located on the number line.

   a) $\frac{3}{4}$ →

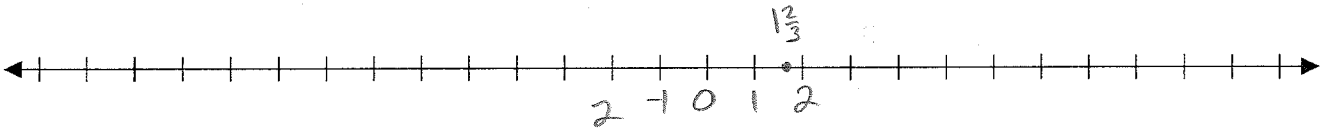




   b) $\frac{5}{9}$ →



   c) $1\frac{2}{3}$



4. Find each missing term.

   (a) $\frac{3}{8} = \frac{?}{32}$ 12 (×4, ×4)

   b) $\frac{5}{9} = \frac{15}{?}$ 27 (×3, ×3)

5. Write 5 equivalent fractions for each fraction.

a) $\frac{2}{5} = \frac{4}{10} = \frac{6}{15} = \frac{8}{20} = \frac{10}{25} = \frac{12}{30}$ b) $\frac{7}{10} = \frac{14}{20} = \frac{21}{30} = \frac{28}{40} = \frac{35}{50} = \frac{42}{60}$

6. Compare the following fractions using > < or = . Show how you know which is larger.

a) $\frac{5}{6} > \frac{4}{6}$ b) $\frac{1}{2} < \frac{5}{8}$ ($\frac{4}{8}$) c) $\frac{10}{18} < \frac{4}{6} = \frac{12}{18}$

5 bigger than 4 same denominator

common denom then compare numerators

7. Write the fractions in order from least to greatest. Show or explain how you figured out the order.

(a) $\frac{1}{4}, \frac{1}{3}, \frac{1}{8}$ $\frac{6}{24}, \frac{8}{24}, \frac{3}{24}$ $\frac{1}{8}, \frac{1}{4}, \frac{1}{3}$ common denom needed to compare

(b) $\frac{2}{3}, \frac{3}{5}, \frac{5}{8}$ $\frac{80}{120}, \frac{72}{120}, \frac{75}{120}$ $\frac{3}{5}, \frac{5}{8}, \frac{2}{3}$

6. Express each fraction as a decimal.

(a) $\frac{3}{5}$ 0.6 (b) $\frac{1}{8}$ 0.125 (c) $1\frac{1}{3}$ $1.\overline{3}$

7. Write each decimal as a fraction.

(a) 0.3 $\frac{3}{10}$ (b) 0.254 $\frac{254}{1000}$ (c) 3.16 $3\frac{16}{100} = \frac{316}{100}$

8. Model each fraction **and** then convert each mixed fraction to an improper fraction.

a) $1\frac{1}{2}$  $\frac{3}{2}$

b) $3\frac{4}{5}$  $\frac{19}{5}$

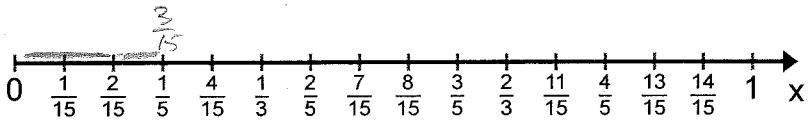
c) $5\frac{2}{3}$  $\frac{17}{3}$

9. Model each fraction **and** then convert each improper fraction to a mixed fraction.

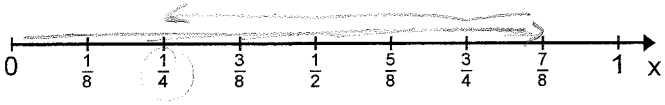
a) $\frac{5}{3} = 1\frac{2}{3}$ b) $\frac{16}{5} = 3\frac{1}{5}$ c) $\frac{22}{9} = 2\frac{4}{9}$

10. Model and calculate.

(a) $\frac{2}{15} + \frac{1}{15} = \frac{3}{15}$



(b) $\frac{7}{8} - \frac{5}{8} = \frac{2}{8} = \frac{1}{4}$



11. Calculate.

(a) $\frac{1}{2} + \frac{3}{8} = \frac{4}{8} + \frac{3}{8} = \frac{7}{8}$

(b) $\frac{3}{5} - \frac{1}{7} = \frac{21}{35} - \frac{5}{35} = \frac{16}{35}$

(c) $1\frac{1}{4} + 1\frac{1}{5} = \frac{5}{4} + \frac{6}{5}$
$= \frac{25}{20} + \frac{24}{20} = \frac{1}{20}$

(d) $2\frac{1}{6} - 1\frac{3}{4} = \frac{13}{6} - \frac{7}{4}$
$= \frac{26}{12} - \frac{21}{12} = \frac{5}{12}$

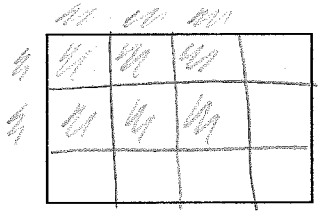
12. At the movies, Tony ate $\frac{1}{5}$ of the container of popcorn, Leroy ate $\frac{1}{3}$ and Joya ate the rest.

(a) Who ate more of the popcorn, Leroy or Tony? $\frac{1}{5} = \frac{3}{15}$ (Tony) $\frac{1}{3} = \frac{5}{15}$ (Leroy)

(b) What fraction of the popcorn did Joya eat? $\frac{15}{15} - \frac{3}{15} - \frac{5}{15} = \frac{7}{15}$

13. Model the product.

$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$



$= \frac{6}{12}$

13. Find each product.

(a) $\frac{\cancel{2}}{5} \times \frac{2}{\cancel{9}_3} = \frac{2}{15}$

(b) $\frac{3}{4} \times \frac{5}{1} = \frac{15}{4}$

(c) $\frac{\cancel{2}}{5} \times \frac{1}{\cancel{4}_2} = \frac{1}{10}$

(d) $1\frac{2}{3} \times \frac{2}{5} = \frac{5}{3} \times \frac{2}{5} = \frac{2}{3}$

Means multiply

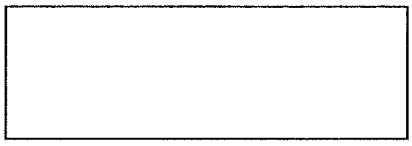
14. Marie practiced on the violin for $1\frac{3}{4}$ hours. For $\frac{1}{3}$ **of** that time she practiced scales. What fraction of an hour did she spend on scales?

$\frac{1}{3} \times 1\frac{3}{4}\text{hrs} = \frac{1}{3} \times \frac{7}{4}\text{hrs} = \frac{7}{12}\text{hrs}$

15. Model the quotients.

(a) $\frac{6}{10} \div \frac{2}{10} = \frac{\overset{3}{\cancel{6}}}{\cancel{10}} \times \frac{\cancel{10}}{\cancel{2}} = 3$

(b) $\frac{5}{8} \div \frac{1}{4} = \frac{5}{\cancel{8}_2} \times \frac{\cancel{4}}{1} = \frac{5}{2}$



16. Find each quotient.

(a) $\frac{8}{10} \div \frac{2}{10} = \frac{\overset{4}{\cancel{8}}}{\cancel{10}} \times \frac{\cancel{10}}{\cancel{2}} = 4$

(b) $\frac{2}{3} \div \frac{3}{4} = \frac{2}{3} \times \frac{4}{3} = \frac{8}{9}$

(c) $3 \div \frac{3}{5} = \frac{3}{1} \times \frac{5}{3} = 5$

(d) $\frac{5}{8} \div 1\frac{1}{2} = \frac{5}{8} \div \frac{3}{2}$

$= \frac{5}{\overset{4}{\cancel{8}}} \times \frac{\cancel{2}}{3} = \frac{5}{12}$

17. Calculate - where $a = \frac{2}{5}$, $b = \frac{1}{2}$ and $c = \frac{3}{4}$ *(don't forget BEDMAS)*

a + b x c

$= \frac{2}{5} + \frac{1}{2} \times \frac{3}{4}$

$= \frac{2}{5} + \frac{3}{8}$

$= \frac{16}{40} + \frac{15}{40} = \frac{31}{40}$

$b^2 + c$

$= \left(\frac{1}{2}\right)^2 + \frac{3}{4}$

$= \frac{1}{4} + \frac{3}{4}$

$= \frac{4}{4} = 1$

c(b - a)

$= \frac{3}{4}\left(\frac{1}{2} - \frac{2}{5}\right)$

$= \frac{3}{4}\left(\frac{5}{10} - \frac{4}{10}\right)$

$= \frac{3}{4}\left(\frac{1}{10}\right) = \frac{3}{40}$

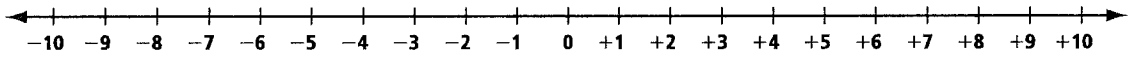
ac ÷ b

$= \left(\frac{2}{5}\right)\left(\frac{3}{4}\right) \div \frac{1}{2}$

$= \frac{3}{10} \times \frac{2}{1} = \frac{3}{5}$

INTEGERS

Use your number line to answer many of the following questions.

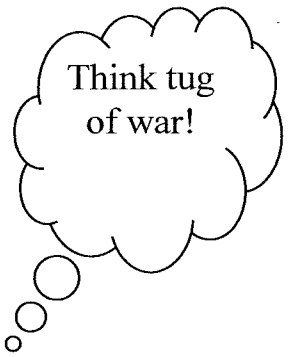


1. Use a suitable integer to show each of the following.
   (a) a **gain** of $4 — +4
   (b) 5 steps **backwards** — -4
   (c) 2 m **below** sea level — -2

2. Compare each pair of number using < or > to make each statement true.
   (a) -15 [<] -4 (b) -12 [>] -23 (c) 0 [>] -12

3. Arrange the following integers in order from **least** to **greatest.**
   (a) +5, 0, -3, -5, 12, -8 — -8, -5, -3, 0, 5, 12
   (b) +4, -8, -1, -10, 15, -17 — -17, -10, -8, -1, 4, 15

4. Find each sum.
   (a) +2 + (+4) — 6
   (b) (+7) + (+3) — 10
   (c) (-3) + (-4) — -7
   (d) (-4) + (-6) — -10
   (e) (-3) + (+4) — 1
   (f) (-7) + (+11) — 4
   (g) (+4) + (-6) — -2
   (h) (-11) + (+5) — -6
   (i) -20 + 17 — -3
   (j) 15 + (-11) + (-16) — -12
   (k) 16 + -9 + 12 + -11 + -3 — 5
   (l) (-84) + 72 + (-10) + 12 — -10



5. Find each **difference**. Consider drawing a picture to show how you know your answer is correct (use chips, number line or changing the question to an addition question (tug of war question).

(a) 5 - 1 = 4

(b) 2 - 6 = -4

(c) -3 - 8 = -11

(d) 4 - (-11) = 15

e) -3 - (-9) = 6

(f) -10 - 8 = -18

(g) -35 - 18 = -53

(h) 52 - (-11) = 63

(i) -14 - 27 = -41

(j) 16 - (-20) - 1 - (-13) = 48

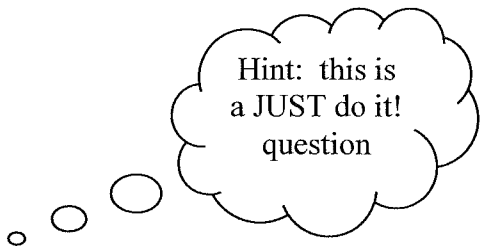
6. On Monday, the price of gold was $478. On the following Monday, the price of gold was $475. How did the value of gold change, and by how much, in this one week? SHOW CALCULATION

Answer: 478 - 475 = $3 down

7. The height of Mount McArthur is 4344 m **above sea level.** The height of the Caspian Sea is 28 m **below sea level.** How much higher is Mount McArthur than the Caspian Sea? SHOW CALCULATION

Answer: 4344 + 28 = 4372

8. Calculate.



(a) (+6)(+5) = 30

(b) (+3)(-4) = -12

(c) (-8)(+6) = -48

(d) (-3)(-5) = 15

(e) (+12)(+7) = 84

(f) (-2)(5)(-3) = 30

(g) (-1) (10) (4)(2) = -80

(h) (-3)(-4)(-11)(-2)(0) = 0

9. Find each quotient.

(a) (+36) ÷ (+9) 4

(b) (+48) ÷ (-4) -12

(d) (+12) ÷ (-6) -2

(e) (+49) ÷ (-7) -7

(c) (-24) ÷ (+8) -3

(g) (-36) ÷ (+9) -4

(f) (-40) ÷ (-8) 5

(h) (-20) ÷ (-5) 4

(i)

$-24 \div (2) \div (-3)$ 4

10. Calculate. SHOW YOUR WORK

$6 \times 3 - (-2)$
$= 20$

$2 - (-6) \div 3$
$= 2 - -2$
$= 4$

$(-2)^3$
$= -8$

$-12 + 18 \div (-3) - 4$
$= -12 - 6 - 4$
$= -22$

$(-3) \times [(-4) + (-2)]$
$= +18$

$[(+6) + (-2)] \div (-4)$

$3^2 + (-4)^2$

$(-2) \times (-3)^2$

11. Fill in the chart:

Exponential form	Expanded form	Standard form
5^3	$5 \cdot 5 \cdot 5$	125
10^4	$10 \cdot 10 \cdot 10 \cdot 10$	10,000
$(-3)^5$	$(-3)(-3)(-3)(-3)(-3)$	-243
$(-2)^6$	$(-2)(-2)(-2)(-2)(-2)(-2)$	64
3^4	$3 \times 3 \times 3 \times 3$	81
$(-1)^6$	$(-1)(-1)(-1)(-1)(-1)(-1)$	1

12. Use the exponent laws to simplify the following:

$(2^4)(2^3) = 2^7$

$(3^6)(3^7)(3) = 3^{14}$

$(-2)^7 (-2)^9 = (-2)^{16}$

$5^8 \div 5^3 = 5^5$

$6^{12} \div 6^4 = 6^8$

$(-4)^5 \div (-4) = (-4)^4$

$2^9 \times 2^4 \div 2^5 = 2^8$

$10^{15} \div 10^5 \times 10^3 = 10^{13}$

EXPRESSIONS

1. Model and then simplify expressions that look like: (Shaded are positive)

a) $5n + 2 - 4n - 6 + n$

Model: 

Simplified: $= 2n - 4$

b) $3(2n - 4)$

$= 6n - 12$

c) $-2(4n + 3)$

$= -8n - 6$

2. Evaluate expressions given the values for each of the variables.

a) $8a + 2b - 9$
where $a = 3$ and $b = -2$

$= 8(3) + 2(-2) - 9$
$= 24 - 4 - 9$
$= 11$

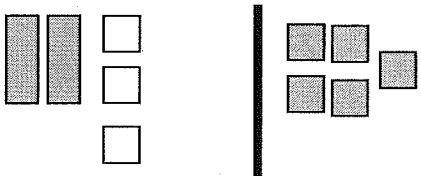
b) $4(2c - d)$
where $c = 5$ and $d = -2$

$= 4(2(5) - (-2))$
$= 4(10 + 2)$
$= 48$

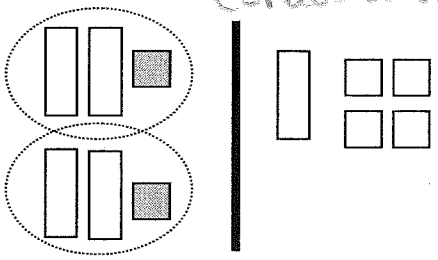
c) $8 - 2(n - m) + 3m$
where $n = 5$ and $m = 9$

$= 8 - 2(5 - 9) + 3(9)$
$= 8 - 2(-4) + 27$
$= 8 + 8 + 27$
$= 43$

3. Identify what equation is illustrated with the following models: (shaded are positive)



$2x - 3 = 5$



$2(-2x + 1) = -x - 4$

shaded are positive

5. Model the following equations:

a) $n - 5 = 3$

b) $8 - 2n = 2n$

c) $-4n = 12$

d) $2(3n - 1) = 5n$

6. Solve one step equations, showing all the appropriate algebraic work.

a) $n - 2 = 10$
$+2 \quad +2$
$n = 12$

b) $-12 = x + 8$
$-8 \quad -8$
$-20 = x$

c) $\frac{3n}{3} = \frac{-21}{3}$
$n = -7$

d) $\frac{-4n}{-4} = \frac{20}{-4}$
$n = -5$

Check your answers:

$n - 2$	10
$12 - 2$	
10	10 ✓

-12	$x + 8$
	$-20 + 8$
-12	-12 ✓

$3n$	-21
$3(-7)$	
-21	-21 ✓

$-4n$	20
$-4(-5)$	
$+20$	20 ✓

7. Solve two step equations, showing all the appropriate algebraic work.

a) $2n + 3 = 21$
$-3 \quad -3$
$\frac{2n}{2} = \frac{18}{2}$
$n = 9$

b) $5 + 7n = -9$
$-5 \quad -5$
$\frac{7n}{7} = \frac{-14}{7}$
$n = -2$

c) $8n - 10 = 6n$
$+10 \quad +10$
$8n = 6n + 10$
$-6n \quad -6n$
$\frac{2n}{2} = \frac{10}{2}$
$n = 5$

d) $-18 = 4n + 6$
$-6 \quad -6$
$\frac{-24}{4} = \frac{4n}{4}$
$-6 = n$

Check your answers:

$2n + 3$	21
$2(9) + 3$	
$18 + 3$	
21	21 ✓

$5 + 7n$	-9
$5 + 7(-2)$	
$5 + -14$	
-9	-9 ✓

$8n - 10$	$6n$
$8(5) - 10$	$6(5)$
$40 - 10$	30
30	30 ✓

-18	$4n + 6$
-18	$4(-6) + 6$
	$-24 + 6$
-18	-18 ✓

8. Solve multi-step equations, showing all the appropriate algebraic work.

a) $4n - 2 = 7n + 10$
$-4n \quad +10 \quad -4n \quad -10$
$\frac{-12}{3} = \frac{3n}{3}$
$-4 = n$

b) $15 - 3n = 2n - 5$
$+5 \quad +3n \quad +3n \quad +5$
$\frac{20}{5} = \frac{5n}{5}$
$4 = n$

c) $3(4x + 6) = 18$
$12x + 18 = 18$
$-18 \quad -18$
$\frac{12x}{12} = \frac{0}{12}$
$x = 0$